

Historic, archived document

Do not assume content reflects current
scientific knowledge, policies, or practices.



A Leaders' Guide to

**Agriculture's Defense
Against Biological Warfare
and Other Outbreaks**

(A Technical Presentation)

ARS 22-75

December 1961

Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

TO AGRICULTURAL LEADERS:

You might arrive at work someday and find your office crowded with excited farmers asking advice about a strange ailment that suddenly struck down their entire livestock herds or devastated their crops. Or you may get a phone call from some agricultural leader faced with this problem.

This could be the tip-off to a dreaded alien disease or pest that has accidentally slipped past our border guard. Or it could mean that an enemy agent has struck the first blow in biological warfare.

Whatever the explanation, the way you react to this situation may give the Nation a chance to isolate and control the destructive pest and possibly to eradicate it--or, on the other hand, may place us under a costly handicap.

Biological warfare is a distinct possibility and everyone who works with or advises farmers should understand the danger and the ways of meeting it. This special report is designed to give some of the information that you and your fellow leaders may need in such a situation.

There are government programs to cope with agricultural diseases and pests. Day in and day out, such problems are being dealt with through the cooperative efforts of Federal, State, and local agencies. Moreover, there are special arrangements for dealing with the occasional serious outbreak. These arrangements can be put into operation promptly.

More powerful counter measures will be required, however, in case an enemy wages biological warfare on American agriculture. Provisions exist to deal with this contingency, too. The cooperative peacetime machinery will still be utilized, but tied closely to USDA State and County Defense Boards. These Boards have been established throughout the country under the National Plan for Civil Defense and Defense Mobilization. The State Boards will have plans and the means of obtaining support materials and services to meet a disease or pest emergency through their wartime control activities.

Information in this report was provided by regulatory divisions of the Agricultural Research Service, the Poultry Division of the Agricultural Marketing Service, and the Food and Materials Division of the Agricultural Stabilization and Conservation Service.

A LEADERS' GUIDE TO AGRICULTURE'S DEFENSE AGAINST BIOLOGICAL WARFARE AND OTHER OUTBREAKS

(A Technical Presentation)

Agriculture is a mainstay of the Nation now as it has always been, and as such, is a tempting target for any enemy nation with aggressive intent. The implements exist for making war on our agriculture. It is the better part of prudence, therefore, to acknowledge and understand the possibility of such sabotage or attack and to know what and how counter measures can be used.

NATURE OF THE PROBLEMS

Our strong, vigorous, and healthy nation is dependent on great quantities of meat, dairy, and poultry products, fruits, vegetables, cereals and fiber crops for many essentials. Plant products such as cotton and flax and animal products such as wool and leather also contribute in a variety of ways to health and welfare. Moreover, animals are irreplaceable sources of certain biological products, including vaccines, serums, and glandular extracts necessary for the prolongation of human life.

In wars, food carries a priority rivaling ammunition. Our military forces rely on foods of animal origin for 40 percent of their rations, and for about 70 percent of the food values of their diet. Major military campaigns have been won or lost depending on the availability of food. Reducing the enemy's food supply is a part of every major war plan. The grain-laden freighter, has traditionally been a prime target for the submarine. There are, however, many and varied arts and tools of modern warfare, each fashioned to weaken or destroy one of the main elements of a nation's strength. Biological warfare (BW)--an effective modern way to destroy food and fiber at the source through diseases and parasites--could play a decisive role in any wars that are not decided with push-button speed.

Biological warfare employs disease agents, insects and parasites to weaken or destroy humans, livestock, crops, or food supplies. This report will deal with the use of pests and diseases against agriculture, including some that also harm man. Biological warfare can be effected from within a country's borders or launched subtly from without. It can take on the guise and even utilize the normal practices of agriculture or agricultural commerce and cause great losses to farmers, distributors, processors, handlers, and consumers of agricultural products.

The deliberate and planned use of a livestock or crop disease or pest as an act of sabotage can be managed with devastating effect on a nation's peacetime economy or its war effort. Spores of a grain rust or other disease-producing organism or destructive insects could be released on the winds, which could spread the disease or pest rapidly over a wide area. A virus released unobtrusively in a stockyard, a large feeding center, or other livestock assembly area would likewise spread fast and far. The crop or class of livestock, the disease or pest, and the time

and place for an outbreak can be selected to cause the greatest interference with the nation's war effort. Simultaneous introduction of related animal diseases--for example, the vesicular group of foot-and-mouth disease, vesicular exanthema or VE, and vesicular stomatitis or VS--with their similar symptoms but certain contradictory signs and various incubation periods can confuse diagnosis, complicate control measures, and even act synergistically to increase the injury. Similarly, the simultaneous introduction of a crop or animal disease and its insect vector could be most devastating. Outbreaks of these diseases or combinations of them can, of course, arise accidentally.

Especially feared are a number of highly contagious foreign diseases and prolific pests which this country has guarded against for years. Occasionally one of them has slipped past our guard or an old established one has broken out with new vigor. It is important to know that these threats exist and that the necessary knowledge and machinery exist in this country to combat the threats.

The Animal Disease Problem

Animal diseases and parasites are important limiting factors in the production of the livestock in any country. Failure to control them can lead to heavy annual losses of livestock, to high costs of production, and ultimately to widespread restrictions on commerce seriously affecting the national welfare.

Diseases and parasites travel as man and his animals travel. Man tends to bring home animals or distinctive meat products collected on his travels, including gift packages of sausage or other meats from his foreign relatives and friends. These animals and products frequently harbor animal diseases. Slower travel in the past gave animals time to develop symptoms of most diseases and parasite infestations before they reached our shores. But rapid surface-and-air transit have removed this deterrent and made inspection and quarantine vastly more difficult. Moreover, there are many ways for diseases to get in.

We are apt to emphasize foreign animal diseases when we speak of biological warfare against animals. We must not, however, forget for a moment that those diseases already present within our country are current and potential disease problems. Some of these diseases could cause as much damage as any foreign plague if allowed to run unchecked or deliberately spread among our farm animals.

Regardless of how disease agents or parasites are introduced, our livestock population is a highly vulnerable target for them. Without prior exposure to the foreign diseases and parasites, our livestock has not had the opportunity to develop genetic resistance to them. Specialization in the industry and resultant large concentration of certain species in some areas, coupled with the herding instincts and feeding habits of the animals, make them particularly vulnerable to the introduction and spread of diseases. Due to the complex and rapid movement of livestock from all areas into central livestock markets and the reshipment of many of them to farms for feeding or breeding, introduced diseases can quickly get out of hand.

These vulnerable conditions are known to livestock specialists throughout the world and could be intentionally exploited. For that reason we must know all we can about these diseases.

Here are some of the most feared foreign animal diseases (underscored below) that might be used in a biological attack, together with certain similar but less-serious domestic and foreign diseases that confuse diagnosis of the serious ones:

Vesicular Diseases

Foot-and-mouth disease of cloven-hoofed animals and vesicular exanthema (VE) of swine cause abortions and high mortality in young animals. Although mortality is relatively low in adult animals, the diseases nevertheless take a heavy toll in meat and dairy products. They present identical symptoms in swine and cannot be differentiated through clinical observations. Laboratory or biological tests must be relied on. Several types or strains of virus cause each disease and within these strains are variants that further complicate diagnosis and control. Vaccine and serum effective against one type will not protect against another.

Foot-and-mouth disease, one of the most dreaded of all livestock diseases, gained entrance to this country six times between 1902 and 1929, and was eradicated each time. But it took the lives of over 325,000 domestic animals and 22,000 deer--a loss of \$390 million based on the economy at that time. Between 1947 and 1956 we spent \$135 million to help eradicate the disease in Mexico to prevent its entrance into the United States, and similarly spent over \$683,000 to protect our livestock from a Canadian outbreak in 1952. An outbreak in this country now would probably cost us over a half billion dollars.

The VE outbreak in the 1952-1956 period took a toll of 1 million swine, cost \$22 million to eradicate, and caused indirect losses of over \$20 million to the livestock industry, including biological firms, packers, breeders, and sales barns.

Swine Diseases

Two dreaded foreign diseases (Teschen disease and African swine fever) and some diseases well known in this country (hog cholera, swine erysipelas, and certain nutritional deficiencies in swine) form another group with confusingly similar symptoms. Teschen disease, a virulent, contagious encephalomyelitis of swine caused by a virus, is a serious problem in several eastern European countries. This disease spreads unpredictably, breaks out sporadically, and has killed as many as 50,000 pigs in Czechoslovakia alone in one year. It resembles but is distinct from contagious encephalomyelitis and the other swine diseases mentioned here.

African swine fever is a particularly virulent, fatal, and highly contagious swine disease that may be widely distributed in a new area by the time it is distinguished from hog cholera. Some young animals survive, however, and continue to spread the disease. The disease has been reported in East and South Africa, and recently in Spain and Portugal. Infected animals must be slaughtered and burned or buried deep. Also feared are foreign strains and possible new mutant strains of hog cholera. One very destructive strain suddenly appeared in the Midwest in 1949. The variant virus had low antigenic properties and thus did not produce good vaccines. Vaccines have been used with variable success against Teschen disease, but neither they nor the commonly used hog-cholera vaccines would protect swine from any of these other diseases. New strains of any of these viruses probably would present the same problem.

Rift Valley Fever

Rift Valley fever is an important influenzalike virus disease of man as well as some domestic animals. It causes necrosis of the liver. Effects of Rift Valley fever (RVF) range from unthriftiness and a transient fever to fatalities of about 10 percent in adult cattle and 20 percent in adult sheep, and to almost 100 percent fatality in young lambs and calves and high abortion rates in sheep and cows. The disease occurs sporadically during damp periods over wide areas of Africa. It is spread by mosquitoes and by direct contact. Farmers have become infected by handling infected herds and flocks; butchers, delivery boys, and housewives by handling infected meat; and veterinarians by making post-mortem examinations. RVF runs its course in about 4 days. Like some of the swine fevers, RVF is easily confused with several lesser domestic or alien diseases--in this case, enterotoxemia, bluetongue, vibriosis of sheep, Q-fever of cattle and sheep, and Wesselsbron disease of sheep. Blood-serum tests are required to differentiate them. Vaccines have been developed and mass immunization is recommended when the disease breaks out.

Rinderpest

Rinderpest, a devastating foreign disease of cattle, together with two other cattle diseases recently discovered in this country (mucosal disease and virus diarrhea), also form a hard-to-differentiate group. All three have similar signs, symptoms, and pathologies. Rinderpest has killed 75 to 90 percent of the highly susceptible cattle population in countries where it has occurred. Mucosal disease, widespread in some dairy and beef areas, affects only a small percent of a herd but kills a high percent of the infected animals. Virus diarrhea, less serious, ranges from a mild but contagious form (frequently unnoticed) to a severe form having all the appearances of rinderpest.

Lumpy-skin Disease

Lumpy-skin disease is an acute virus disease of cattle which produces a high fever and from one to several hundred nodular swellings in the skin. These symptoms may last from a few days to a year or longer. Nodules may form in any part of the body, and in the respiratory tract sometimes cause death through suffocation. Economic losses may be heavy due to skin damage, pneumonia, emaciation, loss of milk, and injury to reproductive organs. The disease appears to be carried by insects or other vectors. It may strike only individual animals in a herd, and often passes over herds for miles to infect another herd or animal. Thus it can spread rapidly over a country.

Fowl Plague

Fowl plague is a highly fatal virus disease of chickens and turkeys. It occurs in Europe but may be present in Asia, North Africa, and possibly South America. The disease appears simultaneously throughout an infected flock, causing death in 2 to 4 days. A killed-virus vaccine gives a brief immunity, but there is no cure for infected birds.

Other Animal Diseases

Other foreign diseases, including some which are exacting in their environmental requirements, might be introduced in ways to cause great damage. Even diseases that are difficult to transmit experimentally (bovine pleuropneumonia, for example) may be dangerous in the hands of an expert saboteur. Man is capable also of altering the characteristics of a microorganism by selecting variants with increased pathogenicity and survival ability.

The Plant Pest Problem

This country loses over \$9 billion to insects, diseases, and weeds each year in producing farm crops and grazing valued at \$24 billion. The agricultural economy has accommodated itself to this great cost. Without adequate controls, the loss would be much higher, the Nation's food and fiber supply endangered, and agricultural commerce and related industries greatly impaired. The European corn borer is an example of the costliness of an introduced pest allowed to spread.

Due to the extensive commerce in plants and crop products in this country, a disease, insect pest, or weed could be introduced and widely distributed by the time it is discovered. And even though it is already established and being fought in certain localities, or has previously invaded and been eradicated from the country, it still could be used in biological warfare. Man's tendency to collect and carry plants on his travels compounds the problem. This is particularly true of persons coming from foreign countries. And these diseases and pests are often contained in or on agricultural commodities in domestic and international trade.

Our crop varieties have been selected and developed for their ability to produce well in our normal environment. Since many of them have not been exposed to foreign diseases and pests, they may lack resistance or tolerance to them. Moreover, important disease-producing agents may hybridize or mutate, giving rise to more virulent forms of disease. We must not discount the possibility of an enemy agent creating and disseminating new strains of existing diseases and pests. Meanwhile, attempts to confine a new pest may upset the crop-production and land-utilization patterns of the infested area and obstruct normal commerce in the affected crops.

Here are some of the most-feared crop diseases and pests (underscored below)--some already present, some recently eradicated, and some that have never reached our shores:

Pests Now in this Country

Golden nematode has been present on Long Island since 1941. Strict State quarantine and control measures have so far confined it to a small area of that island. It is a major agricultural threat, however, in Europe and parts of South America, cutting potato yields as much as 85 percent. In the United States, therefore, it is a threat to 1½ million acres of potatoes distributed through the 50 States. Once established, this nematode is extremely difficult to get rid of. Its larvae develop tough cysts and can remain inactive but alive in the soil for years.

Khapra beetle, one of the world's worst stored-grain pests, threatens the Nation's \$8-billion supply of stored grain. This beetle was identified in stored grain on our West Coast in 1953. In the next 7 years more than 700 storage buildings in California, Arizona, New Mexico, and Texas were found to be infested. Usual insecticide applications do not reach the beetle, which hides in the grain and in crevices of storage structures. Fumigating entire buildings to destroy the beetle has cost more than \$5 million, and the pest was still a stubborn holdout in 1961. All of our stored grain--about \$8 billion worth yearly--would be threatened if the khapra beetle should spread over the country.

Witchweed is a harmless-looking parasitic weed from Africa and Asia. This pest plant attaches its specialized nutrient-gathering tissues (haustoria) to the roots of corn, sugarcane, sorghum, and other plants of the grass family. It thus takes its required food, nutrients, and water from the host. Its seeds remain viable for years and germinate only when stimulated by excretions from host plants. When the strange weed was found growing in our Southeast in 1956, scientists soon warned that it must be fought as a worse threat to the corn crop than the European corn borer. Quarantine and eradication measures were promptly instituted.

Stem rust of cereals is an old problem in this country. Experience has shown that certain strains can cause great losses. For example, in the United States in 1953 and 1954 a strain known as 15B caused a loss of over 325 million bushels of grain at an estimated cost of almost one-half billion dollars. A new strain of rust to which our wheats lack resistance could spread fast and far if released in the wheat fields of northern Mexico and the Southern Great Plains. Winds would readily spread the spores. With favorable environmental conditions for rust infection and development, a large percent of the United States wheat crop might thus be destroyed and quality of the remainder be impaired.

Pests Once Present and Eradicated

Mediterranean fruit fly, one of the most dreaded pests of soft fruits and vegetables, twice invaded this country--once in 1929 and again about 1956. In both cases it was eradicated. Our \$400-million-a-year national citrus crop is the main stake. Florida citrus growers estimate it would cost them alone \$20 million a year to live with this pest. The pest also attacks 100 other southern and western crops.

Hall scale is destructive, prolific, can be spread widely on infested nursery stock, and is so tiny that it may escape detection for years. For these reasons it is feared as a threat to our entire \$250-million stone-fruit and nut industries. Hall scale weakens the trees and blotches and dwarfs fruits of peaches, nectarines, plums, prunes, and almonds. It damages up to 25 percent of the fruits where established. The State of California and U. S. Department of Agriculture cooperatively waged a costly 20-year campaign to eradicate Hall scale from its three small areas of infestation.

Hoja blanca (Spanish for white leaf) is a devastating virus disease of rice relatively new to the United States. It has caused rice growers concern in widening areas of Latin America since it was first found in this hemisphere in 1952. Just 4 years later it destroyed 25 percent of the rice crop in Cuba and 50 percent in Venezuela. Since the fall of 1957, hoja blanca has been discovered in three of our Southern States, but it is now believed to have been eradicated.

Foreign Pests

Silver "Y" moth and turnip moth, two general pests, are found in Europe, Asia, and Africa. Larvae of the silver "Y" moth damage potatoes, beets, flax, hemp, crucifers, and legumes. When a crop is destroyed, the larvae often migrate in large numbers to other fields. Larvae of the turnip moth feed voraciously on young nursery stock, grain, vegetables, cotton, tobacco, and grapes. The turnip moth has caused widespread famine in Russia in some years.

Five species of potato weevil found in Mexico or parts of South America are very destructive. All have similar habits. The larvae bore through tubers without showing external evidence of infestation; the adults feed on foliage. All have been intercepted at our borders at one time or another. Some may be parthenogenic--that is, able to reproduce without mating. So even one escapee would be dangerous.

Senn pest and durra stalk borer are two important foreign pests of grain and forage crops. Senn pest, a true bug, attacks stems and kernels of small grain in the field. In countries of the Middle East where it is established generally senn pest destroys 25 percent or more of the crop. It has caused more damage in Iraq than grasshoppers, led to famines in Iran, and caused great destruction in Russia and Turkey. The durra stalk borer is potentially more destructive to our corn, broomcorn, and sorghum than the European corn borer has been. It could ruin these crops. The durra stalk borer is widespread in southern Europe, the Middle East, and Africa. It has been intercepted frequently in shipments of broomcorn from Italy.

Asiatic rice borer, a major grain pest, destroys a high percentage of rice shoots and leaves in a heavy infestation of that crop, preventing the setting of grain. It attacks all parts of the corn, sugarcane, and sorghum plants except the roots. The pest has damaged 5 to 10 percent of the total rice crop in Indochina, China, Formosa, and Japan (and up to 60 percent in some localities), seriously damaged the rice crop in Spain within 2 years after becoming evident there, and forced abandonment of much rice acreage in Hawaii. It forced abandonment of corn production in the Mesopotamia area of Iraq. The Asiatic rice borer is frequently intercepted in rice straw from Japan at United States ports of entry.

The apple sucker (Psylla mali) is another foreign pest dangerously close to our borders. It has caused considerable damage in apple orchards in Nova Scotia and New Brunswick, Canada, and in England.

PROTECTION DURING NORMAL TIMES

The United States builds its protective system against agricultural pests on these firmly held objectives:

- Interception of foreign disease-producing agents and pests and keeping them outside our borders.
- Curbing the spread of disease-producing agents and pests within the country.
- Eradication of diseases and pests recently introduced or already established within the country.
- Protection of public health through inspection of meat, poultry, and animal and plant food products in interstate commerce.
- Inspection and regulation of biologics used for protection of animal health.

Our basic protection system against biological warfare is a vast network of people, Federal, State and local agencies, programs, statutes, and procedures centering in the U. S. Department of Agriculture and involving Federal-State-local cooperation. The Department provides centralized national protection against diseases and pests through six divisions with headquarters in Washington, D. C. They are the Animal Inspection and Quarantine Division, the Animal Disease Eradication Division, the Meat Inspection Division, the Plant Quarantine Division, and the Plant Pest Control Division, all of Agricultural Research Service, and the Poultry Division of the Agricultural Marketing Service. These are a coordinated team devoted to keeping foreign diseases and pests out of the country, but dealing with ones that do get in.

Assistance is given by the Armed Forces, the Immigration and Naturalization Service, the Public Health Service, the Food and Drug Administration (all Federal agencies), and by many industry groups such as shippers, cargo forwarders, longshoremen, and treating-plant operators. All farmers and many who work with them or deal with their products have vital duties in the plan and must understand how each fits into the pattern and what to do in case of emergency. State and local regulatory officers work hand in hand with the Federal personnel to provide effective protection.

Protecting Our Borders

The responsibility for keeping foreign diseases and pests of livestock and crops out of the country has been assigned to the Animal Inspection and Quarantine Division and the Plant Quarantine Division. These Divisions in cooperation with the U. S. Customs Service inspect all products capable of conveying livestock or crop diseases or pests. The two agencies maintain inspection stations at our seaports, international airports, and at points along our borders with Canada and Mexico.

Our large import trade in plants and animals and their products, the movement of these materials with our Armed Forces, and the vast non-commercial movement of such materials by travelers offer countless opportunities for the entry of foreign diseases and pests into our country. A border quarantine and inspection system has been guarding against this danger for many years. Since the St. Lawrence Seaway was opened to deep-draft navigation, such pests as khapra beetle have been intercepted in the holds of ships close to the center of the Farm Belt.

Keeping Alien Livestock Diseases Out

A permit is required to import either domestic or wild poultry, including eggs for hatching, and any cloven-footed animal except from Canada and certain States in Mexico. Information in regard to importing animals can be obtained from the Animal Inspection and Quarantine Division, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C.

In the 1961 fiscal year, 719,615 animals were permitted entry at various U. S. ports and 21,702 were rejected because of infections or for other reasons. A considerable number of animals were tested or held in quarantine for various periods to determine whether they were incubating or carrying any diseases. Over 850 million pounds of hides and skins,

wool and hair, bones, meal, meats, and other animal products were inspected, and 145,352 pounds of restricted or prohibited meat were seized and disposed of.

Keeping Alien Crop Pests Out

A permit is also required to bring in foreign plant material including fruits, vegetables, plants, bulbs, and seeds. Many products must be fumigated or otherwise treated to free them from pests before they are permitted entry into the United States.

In 1961 nearly 324,000 lots of unauthorized plant material were intercepted at ports of entry. More than half of this material was in travelers' luggage. Plant quarantine inspectors stopped 25,575 lots of plant pests at our shores and borders in 1961--an average of 1 every 20 minutes. These included destructive insects, plant diseases, nematodes, mites, and snails from throughout the world. A few of the more important plant pests intercepted were: Khapra beetle halted 202 times; the Mediterranean fruit fly, 195 times; the golden nematode, 29 times; the Mexican fruit fly, 151 times; citrus canker, 127 times; and the Mediterranean land snail, 64 times.

Dealing with Pests in this Country

The responsibility for curbing the spread of livestock or crop diseases and pests once they are in the country and to eradicate ones that can be eradicated has been assigned to the Animal Disease Eradication Division and the Plant Pest Control Division. These have jurisdiction over problems involving interstate commerce. Quarantine stations are maintained at various points to prevent the spread of pests across State lines. Many groups other than the U. S. Department of Agriculture also have important jobs to do. Much of the job of control and eradication must be carried out on the farm and in the town, county, or State and involve local (intrastate) commerce. The very nature of the problem requires the Federal, State, and local agencies to work closely together giving effective protection. For example, in a State which has qualified under the Postal Terminal Inspection Act, parcel post packages suspected of containing unauthorized materials can be routed to State Inspectors who may examine them to determine whether State quarantines are being violated.

Once plant diseases or pests have invaded the country, the discovery and curbing of them may be a very complex problem. Although regulatory officials are continuously on guard, the chance discovery of infestation by alert farmers and handlers of farm commodities and by various others associated with agriculture is important at this stage. Local leaders should be alert to any new problems in their farming community and report them promptly.

It is important not only to prevent the interstate spread of diseases and pests, but also to keep them from extending their range within a State. Intrastate regulation of commodities is a State responsibility, even when pests are a national threat. Control and eradication within a State are therefore based on Federal-State cooperation. An impressive network of Federal-State cooperative programs are in operation and an excellent basis exists for jointly attacking new infestations as they arise. Some of these programs operate across several State lines, others within a single State. A common threat, whether interstate or intrastate in character, strongly unifies the regulatory organizations to meet the problem.

Curbing Livestock Diseases

A major effort and substantial progress have been made in controlling and eradicating important infectious diseases of animals, under the direction of the Animal Disease Eradication Division. The States play an important part in this. Eradication is accomplished by a combination of quarantine and various other measures suited to each specific problem. An important example was the program for eradication of vesicular exanthema following its outbreak in swine in 41 States in the 1950's. It's eradication within a few years is attributed partly to quarantining and slaughtering infected animals, but especially to prohibiting the feeding of raw garbage, the major means of building up the disease. All States ultimately required the cooking of garbage before feeding to livestock.

The key to the defense against animal-disease outbreaks, however, is an emergency organization established in each State for keeping informed and administering controls when any animal-disease emergency arises in a normal period. This is a cooperative State-Federal organization headed by the Federal Veterinarian in Charge and the State Veterinarian for each State. The organization also includes some other State and Federal officials. All reports of animal-disease outbreaks should be made promptly to the Federal Veterinarian in Charge. This emergency organization will be used in case of the deliberate introduction of animal diseases.

Curbing Plant Diseases and Pests

On July 1, 1961, the Plant Pest Control Division had 22 programs for the eradication, suppression, or control of plant diseases, insects, nematodes, and weed pests. The work falls into three categories: (1) Surveys to determine the location and extent of infestations, (2) regulations to protect against spread of uninfested areas, and (3) eradication or control measures. All of these programs are administered cooperatively with States, other government agencies, and some with the governments of Canada and Mexico.

Surveys are made by large teams of cooperating State and Federal workers including entomologists, plant pathologists, county farm agents, and other agricultural workers to discover the presence and intensity of diseases and pests. The reports go through a State clearinghouse, similar to the one for livestock diseases, and thence to Washington for consolidation into a national report. This report guides many groups concerned with pest control. This State organization will be used for detection and control in case diseases or pests are introduced deliberately.

Where the infestations are hazardous and can be contained, the affected areas may be quarantined. Entire States or regions may be quarantined, but sometimes only the infested area and a surrounding safety border are placed under quarantine regulations. Common carriers and others can receive and move regulated items only when they are accompanied by a certificate or have been specifically exempted from such requirement.

Transit inspection (examination of shipments moving in interstate commerce to determine if they are moving in conformance with plant quarantine regulations) is conducted by plant quarantine inspectors at some of the major gateways. In fiscal year 1961 more than 600,000 such shipments were examined, 307 of which were found to be moving in violation of Federal domestic plant quarantines and 276 in apparent violation of State regulations. Shippers and carriers are advised about the violations

and the nature of the regulations and need for them. Only those shippers guilty of willful violation or gross negligence are ordinarily prosecuted; others are warned.

Safeguarding Meat and Poultry

A large percent of our domestic livestock and poultry are eventually Federally inspected at meat and poultry slaughtering and processing plants whose products are distributed in interstate and foreign commerce. The purpose is to provide meat and poultry that are wholesome, healthful, fit for human consumption, and truthfully labeled. This inspection system has an important role in detecting animal diseases in normal times and would be even more important in recognizing and alerting the public to new livestock diseases that may be introduced in biological warfare.

Trained inspectors of the Meat Inspection Division under veterinary supervision give a thorough ante-mortem and post-mortem inspection of all livestock slaughtered in such plants. Continuous inspections include the live animals, carcasses, and all processing operations. Processed meats such as the many varieties of fresh, smoked, dried and semi-dried sausage, cured and smoked hams, bacon, canned meats, and frozen meat products are processed under the supervision and inspection of highly trained meat inspectors. This program provides the largest and most complex post-mortem examination operation in the world and is supported by trained specialists and well-equipped pathology, bacteriology, and chemistry laboratories. The disease reporting system is unequalled. It is not surprising that this Division frequently makes the first discovery of a new disease outbreak in this country, since farmers often sell animals for slaughter as soon as sickness shows up. The vesicular exanthema outbreak in hogs was first discovered by meat inspectors.

The Poultry Division of the Agricultural Marketing Service performs a similar service for poultry and poultry food products.

Meat inspectors also have an important role in helping the Animal Disease Eradication Division stamp out contagious diseases. When visible lesions of bovine tuberculosis are found in an animal, this fact is reported to the appropriate disease-eradication officials together with any information from an animal tag, bill of sale, or other source that would identify the animal. Such reporting helps the Federal and State officials trace and test the animal's herd of origin. Under a cooperative arrangement with the industry, blood samples may be taken of animals at slaughter and forwarded with the animals' identities to an appropriate laboratory for testing for brucellosis. Many brucellosis reactors are thus discovered and their herds of origin traced, paving the way for effective eradication measures.

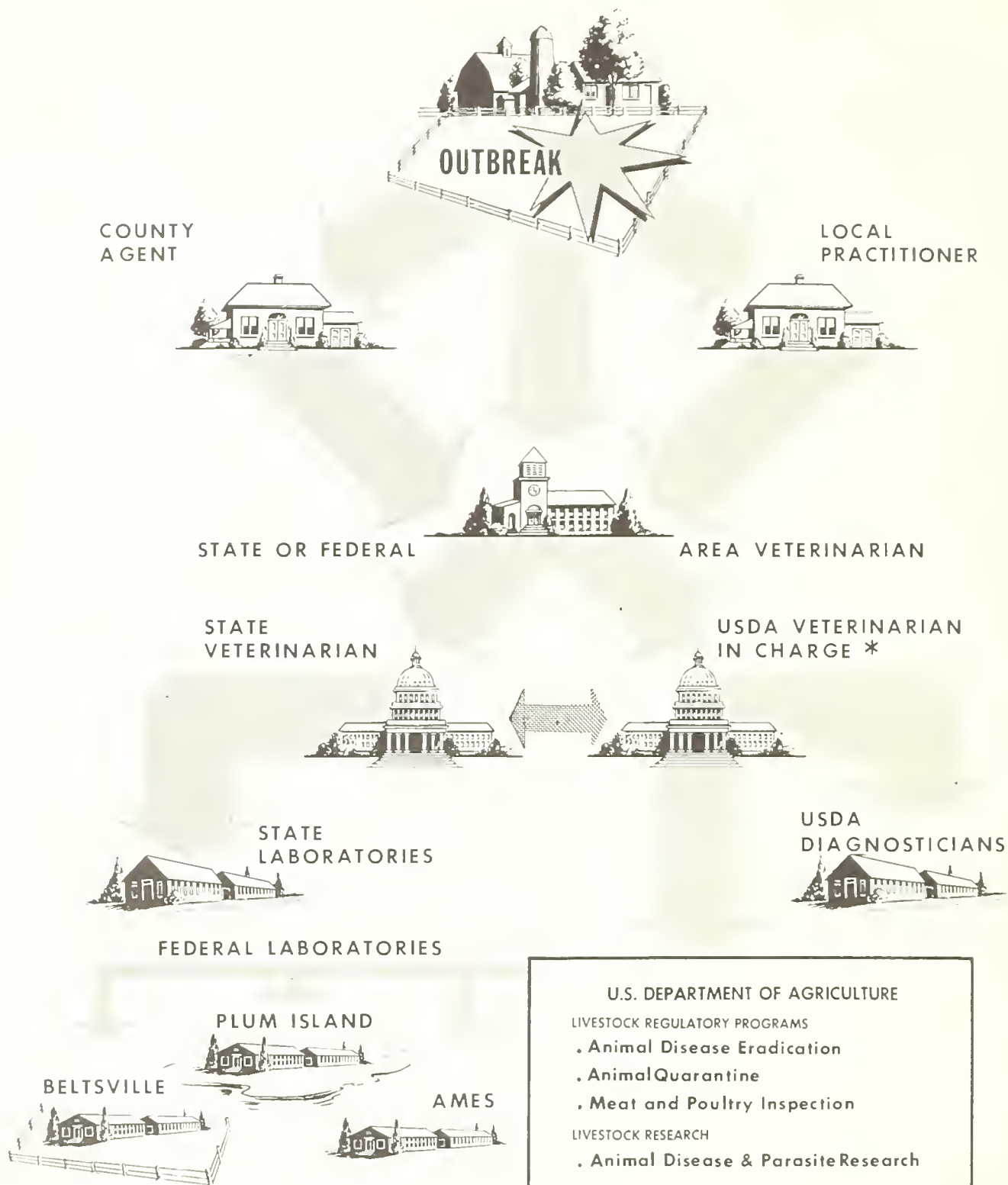
The Animal Disease Eradication Division protects human health through its control and eradication programs on diseases which are transmittible from livestock and poultry to man. Both divisions coordinate their operations to give the maximum protection to human health.

PROTECTION IN EMERGENCIES

While the basic programs have been effective under peacetime conditions, speedier and more decisive action would be needed in the event of biological attack. This greater flexibility is provided in the National Plan for Civil Defense and Defense Mobilization. Under this plan authority and

EMERGENCY ANIMAL DISEASE OUTBREAK

Channels for Reporting and Diagnosis

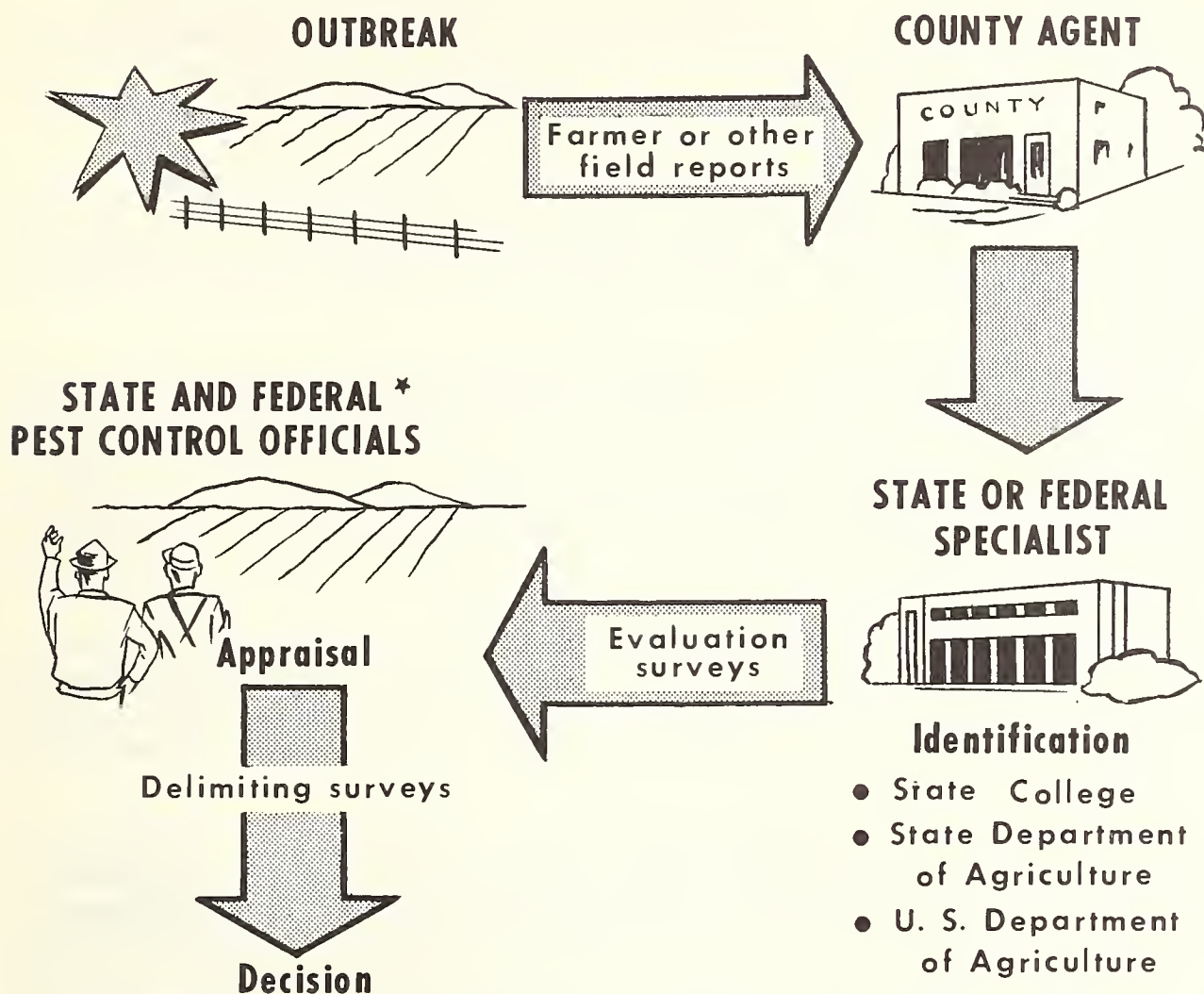


* Under USDA State Administrator during a national emergency

BN-14908-x

EMERGENCY PLANT PEST OUTBREAK

Channels for Reporting, Diagnosis and Action



Cooperating Agencies

- Apply quarantine
- Eradicate or control

* Under USDA State Administrator during a national emergency

U. S. DEPARTMENT OF AGRICULTURE

Plant Pest Regulatory Programs

- Plant Quarantine
- Plant Pest Control

Crops Research Programs

- Entomology Research
- Pathology Research
- Nematology Research
- Weed Research

BN-14907-x

certain responsibilities for protection of food resources and the farm community at large have been delegated to the U. S. Department of Agriculture by Emergency Preparedness Order No. 1 of the former Office of Civil and Defense Mobilization.

The Agricultural Research Service (ARS) carries out the Department's responsibility for protecting crops, livestock, and foods against biological warfare. Organizations and plans for dealing with disease and pest emergencies in peacetime have been integrated into the plan for national defense.

As a part of this plan for civilian defense, the Secretary of Agriculture set up in each State and County a USDA Defense Board. All State Boards include a representative of ARS, as well as representatives of the other action agencies of the Department of Agriculture. ARS is also represented on some County Boards.

Plant and animal disease control operations in the field are carried out through a cooperative Federal-State organization. However, work of this Federal-State organization as it relates to wartime emergencies is closely tied to the USDA State and County Defense Boards. This is accomplished through the ARS member of the USDA State Defense Board and for the most part through the ARS or Extension Service member of the USDA County Defense Board.

The ARS representative on the USDA State Defense Board makes certain that plans are available to carry out wartime control activities and he is prepared through the Chairman of the Board to obtain support materials and services needed to carry on the work in event of an emergency.

Each USDA County Defense Board is informed currently on activities relating to plant and animal disease control at the local level. Plans are made for such participation as might be appropriate in the emergency period. For example, the Board through the Extension or ARS member would assist in reporting certain plant pest or disease outbreaks. In both the pre-emergency and emergency periods the Board would inform farmers on practices that would minimize the disease and pest hazard.

County Agents and other members of the County Defense Board--in fact, all agricultural leaders in the County--have a strong obligation to promptly report any serious or unfamiliar outbreaks of diseases or pests. Charts in this publication show the reporting pattern. These leaders can render a great service also by keeping farmers alerted to the possibilities of following on-the-farm practices (listed on page 15) which will prevent or minimize disease and pest problems.

Defense planning and emergency activities of ARS in relation to activities of the USDA State and County Defense Boards are explained more completely in the USDA State and County Defense Operations Handbooks. These Handbooks are available to members of the Boards.

EVERYDAY PRECAUTIONS AGAINST BIOLOGICAL WARFARE

- *Practice normal sanitation to minimize spread of disease from animal to animal, from farm to farm, and from community to community.*
- *Check your animals regularly. Early discovery and prompt reporting are necessary to wipe out disease before it gets a strong foothold.*
- *Isolate sick or newly acquired stock for 10 days or more to be sure they are not disease carriers.*
- *Promptly report unusual diseases or a rise in old diseases in your animals to a veterinarian or livestock sanitary official. Speed is urgent.*
- *Vaccinate as approved for your local diseases.*
- *Carefully dispose of the wastes and discharges of sick animals and carcasses of animals that have died from contagious diseases.*
- *Don't visit infected or quarantined farms.*
- *Cooperate with plant-disease-control officials.*
- *Promptly inform your county agent of any damage to your crops by unfamiliar diseases or insects.*
- *Do not send insects or diseased plants to anyone but your county agent unless instructed to do so by a responsible agricultural authority.*



Growth Through Agricultural Progress